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Summary report on the technical analysis of the first biennial update report of Ghana submitted on 21 July 2015

In accordance with decision 2/CP.17, paragraph 41(a), Parties not included in Annex I to the Convention (non-Annex I Parties), consistent with their capabilities and the level of support provided for reporting, should submit their first biennial update report (BUR) by December 2014. The least developed country Parties and small island developing States may submit BURs at their discretion.

Further, in accordance with paragraph 58(a) of the same decision, the first round of international consultation and analysis (ICA) will be conducted for non-Annex I Parties commencing within six months of the submission of their first BURs. The process of ICA includes two steps: the technical analysis of the submitted BURs, followed by a workshop on the facilitative sharing of views under the Subsidiary Body for Implementation.

This summary report presents the results of the technical analysis of the first BUR of Ghana undertaken by a team of technical experts in accordance with the modalities and procedures contained in the annex to decision 20/CP.19.

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Contents

		Paragraphs	*Page*
I.	Introduction and process overview	1–6	3
	A. Introduction	1–2	3
	B. Process overview	3–6	3
II.	Technical analysis of information reported in the biennial update report	7–68	4
	A. Scope of the technical analysis	7–8	4
	B. Overview of the elements of information reported	9–17	4
	C. Technical analysis of the information reported	18–67	11
	D. Identification of capacity-building needs	68	19
III.	Conclusions	69–71	20
Annex			
	Documents and information used during the technical analysis		22

I. Introduction and process overview

A. Introduction

1. In accordance with decision 2/CP.17, paragraph 41(a), Parties not included in Annex I to the Convention (non-Annex I Parties), consistent with their capabilities and the level of support provided for reporting, should submit their first biennial update report (BUR) by December 2014. The least developed country Parties and small island developing States may submit BURs at their discretion. Further, in accordance with paragraph 58(a) of the same decision, the first round of international consultation and analysis (ICA) will be conducted for non-Annex I Parties commencing within six months of the submission of their first BURs. The process of ICA includes two steps: the technical analysis of the submitted BURs, resulting in a summary report for each BUR analysed, followed by a workshop on the facilitative sharing of views under the Subsidiary Body for Implementation.

2. This summary report presents the results of the technical analysis of the first BUR of Ghana undertaken by a team of technical experts (TTE) in accordance with the provisions on the composition, modalities and procedures of the TTE under ICA contained in the annex to decision 20/CP.19.

B. Process overview

3. Ghana submitted its first BUR on 21 July 2015.

4. The technical analysis of the BUR took place from 16 to 18 November 2015 in Bonn, Germany, and was undertaken by the following TTE, drawn from the UNFCCC roster of experts on the basis of the criteria defined in decision 20/CP.19, annex, paragraphs 2–6: Mr. Luis Cáceres Silva (former member of the Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention (CGE) from Ecuador), Ms. Anna Sikharulidze (Georgia), Mr. Takeshi Enoki (CGE member from Japan), Mr. Stanford Mwakasonda (United Republic of Tanzania), Mr. Vute Wangwacharakul (former CGE member from Thailand) and Mr. Harry Vreuls (Netherlands). Mr. Enoki and Mr. Wangwacharakul were the co-leads. Ms. Alma Jean and Ms. Karen Ortega (secretariat) provided administrative support to the TTE.

5. During the technical analysis, the TTE and Ghana also engaged in discussion via e-mail, primarily to reach a common understanding on the identification of the capacity-building needs. Following the technical analysis of the BUR, the TTE prepared and shared a draft summary report with Ghana on 17 December 2015 for its review and comments. Ghana, in turn, provided its feedback on the draft summary report on 8 February 2016.

6. The TTE responded to and incorporated the comments referred to in paragraph 5 above from Ghana and finalized, in consultation with Ghana, the summary report on 8 February 2016.

II. Technical analysis of information reported in the biennial update report

A. Scope of the technical analysis

7. The scope of the technical analysis is outlined in decision 20/CP.19, annex, paragraph 15, according to which the technical analysis aims to, without engaging in a discussion on the appropriateness of these actions, increase transparency of mitigation actions and their effects, and shall entail the following:

(a) Identification of the extent to which the elements of information listed in the ICA guidelines contained in decision 2/CP.17, annex IV, paragraph 3(a), are included in the BUR of the Party concerned (see chapter II.B);

(b) A technical analysis of the information contained in the BUR, specified in the "UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention" (hereinafter referred to as the UNFCCC reporting guidelines on BURs) contained in annex III to decision 2/CP.17 and any additional technical information provided by the Party concerned (see chapter II.C);

(c) Identification of, in consultation with the Party concerned, capacity-building needs related to the facilitation of reporting in accordance with annex III to decision 2/CP.17 and to the participation in ICA in accordance with annex IV to decision 2/CP.17, taking into account Article 4, paragraph 3, of the Convention (see chapter II.D).

8. The remainder of this chapter presents the results of each of the three parts of the technical analysis of Ghana's BUR outlined in paragraph 7 above.

B. Overview of the elements of information reported

9. The elements of information referred to in paragraph 7(a) above include: the national greenhouse gas (GHG) inventory report; mitigation actions, including a description of such actions, an analysis of their impacts and the associated methodologies and assumptions, and the progress made in their implementation; information on domestic measurement, reporting and verification (MRV); and support received.

10. Further, in accordance with decision 20/CP.19, annex, paragraph 15(a), in undertaking the technical analysis of the submitted BUR, the TTE shall identify the extent to which the elements of information listed in the guidelines contained in decision 2/CP.17, annex IV, paragraph 3(a), are included in the BUR of the Party concerned. The results of this analysis are presented in tables 1, 2 and 3 below.

1. National greenhouse gas inventory

11. The parts of the UNFCCC reporting guidelines on BURs on reporting information on GHG emissions by sources and removals by sinks in BURs are contained in decision 2/CP.17, paragraph 41(g), and annex III, paragraphs 3–10, of the same decision. Further, as per decision 2/CP.17, annex III, paragraph 3, non-Annex I Parties should submit updates of national GHG inventories according to paragraphs 8–24 of the "Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention" (hereinafter referred to as the UNFCCC guidelines for the preparation of national communications from non-Annex I Parties) as contained in the annex to decision 17/CP.8. The scope of the updates on national GHG inventories should be consistent with

capacities, time constraints, data availabilities and the level of support provided by developed country Parties for biennial update reporting.

12. Table 1 below presents results of the identification of the extent to which the elements of information on GHGs are included in the first BUR of Ghana in accordance with the relevant parts of the UNFCCC reporting guidelines on BURs.

Table 1
Identification of the extent to which the elements of information on greenhouse gases are included in the first biennial update report of Ghana

Decision	*Provision of the reporting guidelines*	*Yes/ Partly/No*	*Comments on the extent of the information provided*
Decision 2/CP.17, paragraph 41(g)	The first BUR shall cover, at a minimum, the inventory for the calendar year no more than four years prior to the date of the submission, or more recent years if information is available	Yes	The latest inventory year reported is 2012
Decision 2/CP.17, annex III, paragraph 5	The updates of the sections on the national inventories of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol should contain updated data on activity levels based on the best information available using the Revised 1996 IPCC Guidelines for National GHG inventories, the IPCC good practice guidance and Uncertainty Management in National GHG Inventories, and the IPCC good practice guidance for LULUCF; any change to the emission factor may be made in the subsequent full national communication	Yes	Updated emission levels are provided. Detailed activity and emission levels are provided in the NIR, which was submitted together with the BUR. GHG emissions for 2012 were estimated using the 2006 IPCC Guidelines
Decision 2/CP.17, annex III, paragraph 9	The inventory section of the BUR should consist of a NIR as a summary or as an update of the information contained in decision 17/CP.8, annex, chapter III (National greenhouse gas inventories), including:		
	• Table 1 (National greenhouse gas inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol and greenhouse gas precursors)	Yes	Ghana provided a summary table of emissions based on the 2006 IPCC Guidelines
	• Table 2 (National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and SF_6)	Yes	Ghana provided a summary table that included emissions of HFCs, PFCs and SF_6
Decision 2/CP.17, annex III, paragraph 6	Non-Annex I Parties are encouraged to include, as appropriate and to the extent that capacities permit, in the inventory section of the BUR:		
	• Tables included in annex 3A.2 to chapter 3 of the IPCC good practice guidance for LULUCF	NA	Tables included in annex 3A.2 to chapter 3 of the IPCC good practice guidance for LULUCF are not

Decision	*Provision of the reporting guidelines*	*Yes/ Partly/No*	*Comments on the extent of the information provided*
			included in the BUR, but similar information was generated from the use of the 2006 IPCC Guidelines, which is reflected in the summary tables in annex 3 of the NIR
	• The sectoral report tables annexed to the Revised 1996 IPCC Guidelines	NA	The sectoral report tables annexed to the Revised 1996 IPCC Guidelines are not included in the BUR, as Ghana used the 2006 IPCC Guidelines. However, comparable information is reported in the tables contained in annex 3 of the NIR
Decision 2/CP.17, annex III, paragraph 7	Each non-Annex I Party is encouraged to provide a consistent time series back to the years reported in the previous national communications	Yes	Time-series data are provided for the years 1990–2012
Decision 2/CP.17, annex III, paragraph 8	Non-Annex I Parties that have previously reported on their national GHG inventories contained in their national communications are encouraged to submit summary information tables of inventories for previous submission years (e.g. for 1994 and 2000)	Yes	
Decision 2/CP.17, annex III, paragraph 10	Additional or supporting information, including sector-specific information, may be supplied in a technical annex	Yes	Additional and supporting information, including sector-specific information, is included in the NIR
Decision 17/CP.8, annex, paragraph 13	Non-Annex I Parties are encouraged to describe procedures and arrangements undertaken to collect and archive data for the preparation of national GHG inventories, as well as efforts to make this a continuous process, including information on the role of the institutions involved	Yes	
Decision 17/CP.8, annex, paragraph 14	Each non-Annex I Party shall, as appropriate and to the extent possible, provide in its national inventory, on a gas-by-gas basis and in units of mass, estimates of anthropogenic emissions of the following gases by sources and removals by sinks:		
	• CO_2	Yes	
	• CH_4	Yes	
	• N_2O	Yes	

Decision	*Provision of the reporting guidelines*	*Yes/ Partly/No*	*Comments on the extent of the information provided*
Decision 17/CP.8, annex, paragraph 15	Non-Annex I Parties are encouraged, as appropriate, to provide information on anthropogenic emissions by sources of HFCs, PFCs and SF_6	Partly	The only source of F-gas emissions included is PFCs from aluminium production
Decision 17/CP.8, annex, paragraph 19	Non-Annex I Parties should, to the extent possible, and if disaggregated data are available, report emissions from international aviation and marine bunker fuels separately in their inventories:		
	• International aviation	Yes	
	• Marine bunker fuels	Yes	
Decision 17/CP.8, annex, paragraph 16	Non-Annex I Parties are encouraged, as appropriate, to report on anthropogenic emissions by sources of other GHGs such as:		
	• CO	Partly	The estimates included are only for the AFOLU sector
	• NO_x	Partly	The estimates included are only for the AFOLU sector
	• NMVOCs	Partly	NMVOCs are not reported in the BUR. However, NMVOCs are reflected in the summary table contained in the NIR summary table, with a zero value
Decision 17/CP.8, annex, paragraph 17	Other gases not controlled by the Montreal Protocol, such as SO_x, included in the Revised 1996 IPCC Guidelines, may be included at the discretion of the Parties	Partly	Information on SO_x is not reported in the BUR. However, this information is reflected in the NIR, with a zero value
Decision 17/CP.8, annex, paragraph 21	Non-Annex I Parties are encouraged to provide information on methodologies used in the estimation of anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol, including a brief explanation of the sources of emission factors and activity data. If non-Annex I Parties estimate anthropogenic emissions and removals from country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines, they should explicitly describe the source and/or sink categories, methodologies, emission factors and activity data used in their estimation of emissions, as appropriate. Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building:		

Decision	*Provision of the reporting guidelines*	*Yes/ Partly/No*	*Comments on the extent of the information provided*
	• Information on methodologies used in the estimation of anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol	Yes	A brief description of the methodology is provided in section 2.3 of the BUR, and a detailed description is provided in the NIR
	• Explanation of the sources of emission factors	Yes	A table on mapping of emission factors is provided in the BUR
	• Explanation of the sources of activity data	Yes	A table on sources of activity data is provided in the BUR
	• If non-Annex I Parties estimate anthropogenic emissions and removals from country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines, they should explicitly describe:	NA	Ghana does not report anthropogenic emissions and removals using country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines
	o Source and/or sink categories		
	o Methodologies		
	o Emission factors		
	o Activity data		
	• Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building	Yes	
Decision 17/CP.8, annex, paragraph 24	Non-Annex I Parties are encouraged to provide information on the level of uncertainty associated with inventory data and their underlying assumptions, and to describe the methodologies used, if any, for estimating these uncertainties:		
	• Level of uncertainty associated with inventory data	Partly	General information is provided in section 2.7 of the BUR, including a table giving the uncertainty range for activity data. The information is not sector specific
	• Underlying assumptions	No	No specific assumptions are provided
	• Methodologies used, if any, for estimating these uncertainties	Partly	A general description indicates that IPCC good practice guidance tier 1 methodologies are used

Abbreviations: AFOLU = agriculture, forestry and other land use, BUR = biennial update report, F-gas = fluorinated gas, GHG = greenhouse gas, IPCC = Intergovernmental Panel on Climate Change, IPCC good

practice guidance = *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, IPCC good practice guidance for LULUCF = *Good Practice Guidance for Land Use, Land-Use Change and Forestry*, NA = not applicable, NIR = national inventory report, NMVOC = non-methane volatile organic compound, Revised 1996 IPCC Guidelines = *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*, 2006 IPCC Guidelines = *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

2. Mitigation actions and their effects

13. The parts of the UNFCCC reporting guidelines on BURs on reporting information on mitigation actions in the BUR are contained in decision 2/CP.17, annex III, paragraphs 11–13.

14. Ghana did report mitigation actions in its first BUR. The mitigation actions reported are provided in tabular format.

15. Table 2 below presents results of the identification of the extent to which the elements of information on mitigation actions are included in the first BUR of Ghana in accordance with the relevant parts of the UNFCCC reporting guidelines on BURs.

Table 2
Identification of the extent to which the elements of information on mitigation actions are included in the first biennial update report of Ghana

Decision	*Provision of the reporting guidelines*	*Yes/ Partly/No*	*Comments on the extent of the information provided*
Decision 2/CP.17, annex III, paragraph 12	For each mitigation action or groups of mitigation actions including, as appropriate, those listed in document FCCC/AWGLCA/2011/INF.1, developing country Parties shall provide the following information to the extent possible:		
(a)	Name and description of the mitigation action, including information on the nature of the action, coverage (i.e. sectors and gases), quantitative goals and progress indicators	Yes	
(b)	Information on methodologies and assumptions:		
	• Methodologies	Yes	
	• Assumptions	Yes	
(c)	Objectives of the action and steps taken or envisaged to achieve that action:		
	• Objectives of the action	Yes	
	• Steps taken or envisaged to achieve that action	Yes	
(d)	Information on the progress of implementation of the mitigation actions and the underlying steps taken or envisaged, and the results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission reductions, to the extent possible:		
	• Progress of implementation of the mitigation actions	Yes	
	• Underlying steps taken or envisaged	Yes	
	• Results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission	Yes	

Decision	*Provision of the reporting guidelines*	*Yes/ Partly/No*	*Comments on the extent of the information provided*
	reductions, to the extent possible		
(e)	Information on international market mechanisms	Yes	
Decision 2/CP.17, annex III, paragraph 13	Parties should provide information on the description of domestic measurement, reporting and verification arrangements	Yes	

3. Finance, technology and capacity-building needs and support received

16. The parts of the UNFCCC reporting guidelines on BURs on reporting information on finance, technology and capacity-building needs and support received in the BUR are contained in decision 2/CP.17, annex III, paragraphs 14–16.

17. Table 3 below presents results of the identification of the extent to which the elements of information on finance, technology and capacity-building needs and support received are included in the BUR of Ghana in accordance with the relevant parts of the UNFCCC reporting guidelines on BURs.

Table 3
Identification of the extent to which the elements of information on finance, technology and capacity-building needs and support received are included in the first biennial update report of Ghana

Decision	*Provision of the reporting guidelines*	*Yes/ Partly/No*	*Comments on the extent of the information provided*
Decision 2/CP.17, annex III, paragraph 14	Non-Annex I Parties should provide updated information on constraints and gaps, and related financial, technical and capacity-building needs:		
	• Constraints and gaps	Yes	During the technical analysis, the Party clarified that the constraints and gaps are reported in its third national communication
	• Related financial, technical and capacity-building needs	Yes	
Decision 2/CP.17, annex III, paragraph 15	Non-Annex I Parties should also provide updated information on financial resources, technology transfer, capacity-building and technical support received from the GEF, Annex II Parties and other developed country Parties, the GCF and multilateral institutions for activities relating to climate change, including for the preparation of the current BUR	Yes	
Decision 2/CP.17, annex III, paragraph 16	With regard to the development and transfer of technology, non-Annex I Parties should provide information on technology needs, which must be nationally determined, and technology support received:		
	• Technology needs, which must be	Yes	During the technical analysis, the Party

Decision	*Provision of the reporting guidelines*	*Yes/ Partly/No*	*Comments on the extent of the information provided*
	nationally determined		clarified that the technology needs, which must be nationally determined, are contained in its third national communication
	• Technology support received	Yes	

Abbreviations: BUR = biennial update report, GCF = Green Climate Fund, GEF = Global Environment Facility.

C. Technical analysis of the information reported

18. The technical analysis referred to in paragraph 7(b) above aims to, without engaging in discussion on the appropriateness of these actions, increase transparency of mitigation actions and their effects. Accordingly, the technical analysis focused on the transparency of information reported in BURs.

19. In addition to covering the information in the BUR and any additional technical information provided by the Party concerned, the technical analysis also focused, in relation to information reported on national GHG inventories, on the consistency of the methods used for developing those inventories with the appropriate methods developed by the Intergovernmental Panel on Climate Change (IPCC) and referred to in the UNFCCC reporting guidelines on BURs. The results of the technical analysis are presented in the remainder of the chapter.

1. Information on national circumstances and institutional arrangements relevant to the preparation of national communications on a continuous basis

20. As per the scope defined in decision 2/CP.17, annex III, paragraph 2, the BURs should provide an update to information contained in the most recently submitted national communication, including, among other things, information on national circumstances and institutional arrangements relevant to the preparation of national communications on a continuous basis. For national communications, non-Annex I Parties report national circumstances following reporting guidance contained in decision 17/CP.8, annex, paragraphs 3–5.

21. In accordance with decision 17/CP.8, annex, paragraph 3, Ghana, in its BUR, reported the following information on national circumstances: a description of its national development priorities, objectives and circumstances, including information on features of geography, national economy, natural resource endowment and dependency (especially water, land and energy), that may affect the ability to deal with mitigation and adaptation to climate change, as well as key development policies and institutional arrangements relevant to climate change.

22. As encouraged in decision 17/CP.8, annex, paragraph 4, Ghana provided a summary of relevant information regarding its national circumstances in tabular format, including the country at a glance, trends in key energy-related indicators and relevant climate change related national policies, legislation and measures. In Ghana's socioeconomic transformation agenda, as set out in the President's coordinated programme of economic and social development policy for 2014–2020, the strategic priority interventions that relate to climate change are anchored on the natural resource management pillar. The information reported in the BUR describes Ghana's national circumstances, in particular, its geography, economy and natural resource dependency. The Ghana Shared Growth and Development

Agenda II and the National Climate Change Policy are anchored on the transformation agenda in the President's coordinated programme of economic and social development policy for 2014–2020.

23. Ghana also reported key development policies and institutional arrangements relevant to climate change, as well as institutional arrangements for the preparation of BURs on a continuous basis. The institutional arrangements for the planning and implementation of climate change in Ghana have established five interrelated coordinated bodies. They are: strategic level institutions, planning budgeting and overall coordinating institutions, implementation institutions, monitoring and reporting institutions and coordination institutions. A diagram describing the key bodies and their linkages is also provided in figure 1 of the BUR. The figure reflects the roles of various institutions in the planning and implementation of climate change in the country as envisaged in the National Climate Change Policy. The information reported in the BUR covers key aspects of the institutional arrangement such as the legal status and the roles and responsibilities of each of the institutions involved, including the coordinating entity, key agencies and experts, mechanisms for information/data exchange, stakeholder engagement, and monitoring and evaluation (M&E). To carry out the preparation and reporting of national communications and BURs on a continuous basis, Ghana has integrated its institutional arrangements for national communications and BURs into a superstructure for coordination of planning and implementation of climate change. Led by the Environmental Protection Agency (EPA), third national communication and BUR working groups have been established to carry out tasks. A diagram illustrating the institutional arrangements for the preparation of the third national communication and the BUR is provided in figure 2 of the BUR.

24. The information reported transparently describes the national circumstances and institutional arrangements for planning and implementing climate change in Ghana. It also demonstrates that the arrangements are able to meet the requirements for the preparation of national communications and BURs on a continuous basis.

2. National greenhouse gas emissions by sources and removals by sinks

25. Ghana reported, in its BUR, information on national GHG inventories covering GHG emissions and removals for the period 1990–2012 using the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the 2006 IPCC Guidelines) and *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance). In response to technical clarification sought by the TTE, Ghana clarified that the BUR contains updated figures compared to the national greenhouse gas emission report, submitted in July 2015, and a summary of its third national communication submitted on 21 July 2015.

26. Ghana describes a national inventory system that it considers capable of supporting the continuous preparation of robust national GHG inventories on a sustainable basis. It reports on reforms that have been introduced since 2006, as part of long-term improvement strategies. These reforms have resulted in revised institutional arrangements, now involving nearly 30 experts from 16 different public and private institutions. The roles and responsibilities of each institution and their reporting lines are arranged to reflect the levels of interlinkages contained in the respective memorandums of understanding. The EPA functions as a single national entity. The TTE commends Ghana for establishing these institutional arrangements, while realizing that the reforms that have already started will continue in the coming years and that capacity-building continues to be needed.

27. The total GHG emissions for 2012, reported in the BUR, excluding agriculture, forestry and other land use (AFOLU), are 18.49 million tonnes of carbon dioxide equivalent (Mt CO_2 eq), an increase of 229.31 per cent since 1990 (12.88 Mt CO_2 eq). The

percentage increase since 2000 is 114.81 per cent, up from 8.61 Mt CO_2 eq, and 17.36 per cent since 2010, up from 15.75 Mt CO_2 eq. The GHG emissions reported in 2012 include 14,811.73 Gg of carbon dioxide (CO_2), 398.05 Gg of methane (CH_4), 24.39 Gg of nitrous oxide (N_2O) and 112.71 Gg of perfluorocarbons (PFCs). Other emissions reported include 110.57 Gg of nitrogen oxides and 1,842.80 Gg of carbon monoxide. Emissions of hydrofluorocarbons, sulphur hexafluoride and other indirect GHGs (non-methane volatile organic compounds), as well as sulphur oxides, are not covered.

28. The GHG emissions from the AFOLU sector accounted for 45.1 per cent of the total national GHG emissions in the year 2012. The emissions from the AFOLU sector increased from 8.61 Mt CO_2 eq in 1990 to 15.17 Mt CO_2 eq in 2012, which is an increase of 76 per cent. The subsector "aggregated and non-CO_2 emissions" accounted for emissions of 10.29 Mt CO_2 eq in 2012, while the "livestock" subsector accounted for emissions of 3.05 Mt CO_2 eq and the "land" subsector for emissions of 1.84 Mt CO_2 eq. The land (or AFOLU) sector recorded the highest increase in CO_2 emissions (261.8 per cent); the emissions increased from a net sink of −3.1 Mt CO_2 in 1990, to a source in 2007 and to emissions of 1.86 Mt CO_2 in 2012.

29. The TTE noted that N_2O emissions were the main emissions source in the AFOLU sector: 9.62 Mt CO_2 eq in 2012, which is 92.7 per cent of the national N_2O emissions. While the N_2O emissions from biomass burning (especially wildfires) have decreased since 1990, the direct and indirect N_2O emissions from managed soils continue to increase.

30. Ghana provides a summary of its GHG inventory in the BUR, but more detailed, transparent and comprehensive explanations on the methods and data used to prepare the national GHG inventory are included in the national inventory report (NIR), which was submitted together with the BUR. In particular, the TTE noted that Ghana provided detailed information on institutional arrangements and GHG inventory processes including: reporting on each category in a systematic manner; analysis of emission trends; key category analysis; description of categories; methodological issues; sources of data (emission factors, activity data and other parameters); time-series data; consistency; source-specific quality assurance/quality control (QA/QC); source-specific recalculations; and planned improvements in data and emission factor issues. The TTE commends Ghana for such well-organized reporting.

31. Information on QA/QC procedures, including the roles and responsibilities for internal procedures, domestic third-party review and international third-party review is reported in the BUR. The TTE commends Ghana for reporting detailed information on these QA/QC procedures, while noting that transparency of information could be further enhanced by including information on other areas such as the control of consistent values in the BUR, the use of the notation key "NE" (not estimated) and the values of non-CO_2 gas emissions in units of Gg and CO_2 eq.

32. The TTE noted that Ghana provided in its BUR a general description of uncertainty assessment, but it did not provide sectoral- and category-specific uncertainty assessments. The TTE noted that the transparency of information reported could be enhanced by providing a category-specific uncertainty assessment.

33. The TTE commends Ghana for reporting on level and trend key category analysis of emissions. It was noted that key category sources were reported to represent 57 per cent (without AFOLU) and 84.7 per cent (with AFOLU) of Ghana's total emissions, while Ghana also reports in the NIR that it is using a value from the 2006 IPCC Guidelines of a 95 per cent representation of total national GHG emissions from key categories. The TTE noted that the transparency of the threshold for key category analysis reported in the BUR could be enhanced by making it consistent with that of the 2006 IPCC Guidelines (95 per cent).

34. The TTE observed that Ghana reported GHG emissions using both mass units (Gg) and CO_2 eq units for different gases. This separation is not clearly shown in the BUR and NIR summary tables. The TTE noted that the transparency of information reported in the BUR could be further enhanced by reporting estimates of emissions/removals on a gas-by-gas basis and in units of mass, as suggested in the UNFCCC guidelines for the preparation of national communications from non-Annex I Parties.

35. The TTE observed that in all of its reporting of GHG emission estimates in the summary tables, Ghana uses numerical values of "0.00" for categories where numerical data are not provided, instead of using notation keys. The TTE noted that the transparency of the information reported could be enhanced if, following decision 17/CP.8, annex, paragraph 22, notation keys were used where numerical data are not provided.

36. The TTE noted that Ghana did not include in the BUR information on differences in estimates of CO_2 emissions from fuel combustion using the sectoral and the reference approaches. However, this information was well presented in the NIR, depicting differences between the two approaches ranging from 2.2 per cent to 50.7 per cent over the 1990–2012 period, with an 8.73 per cent difference in 2012, which is the year of the latest GHG inventory submission. In response to a request for clarification on this issue during the technical analysis, Ghana explained the challenges it faces in matching the differences between the reference and sectoral approaches. Ghana further explained that this issue will be addressed when funding becomes available. In the context of improving the estimates of GHG emissions from fuel combustion, the TTE noted the value of enhancing the capacity of national experts in the use of the reference and sectoral approaches.

37. The TTE noted that in table 3 of the BUR, Ghana uses a number of country- and plant-specific emission factors for estimating emissions from the energy, industrial processes and product use, and AFOLU sectors. However, no information is provided on a description of the country- and plant-specific factors. The TTE noted that the transparency of estimates of the relevant GHG emissions could be further enhanced if descriptions of country- or plant-specific factors are reported, where such information is not confidential.

38. The TTE noted that Ghana included a section in the BUR (section 2.8) containing information on the assessment of the completeness of each sector, whereby a list of categories was provided, for which emissions were considered insignificant or where data were non-existent. The "chemical industry category" (2.B) was not on this list, even though emissions from this area were included in the national total GHG emissions. The category "product uses as substitutes for ozone depleting substances" (2.F), a potential source of emissions, was reported as being both a non-existent and a not-estimated category. The TTE commends Ghana for the provision of information on the missing sources in the current inventory, as well as source-specific planned improvements for each category in the BUR. The TTE noted that the transparency of information reported on GHG emissions could be further enhanced by conducting regular surveys to determine the completeness of all source categories.

3. Mitigation actions and their effects, including associated methodologies and assumptions

39. As indicated in table 2 above, Ghana reported, in its BUR, information on mitigation actions and their effects.

40. Ghana reports three sets of tables for mitigation actions, one for the energy policy level mitigation actions (table 17), one for the mitigation actions of the energy sector including transport (table 18) and one for the mitigation actions of the AFOLU sector (table 19). In addition, annex 3 of the BUR describes all but two of the mitigation actions listed in tables 18 and 19 in detail. The transparency of reporting on two measures, "financial

support for climate mitigation technology uptake" and "financial support for grid-scale and off-grid renewable systems", could be enhanced by including a short description and detailed information. In total, descriptions are provided for 12 mitigation actions from the energy (8 actions) and AFOLU (4 actions) sectors, with 11 of them ongoing and one planned. The mitigation actions all reduce emissions of CO_2, and some actions in the energy sector also reduce CH_4 and N_2O emissions.

41. Ghana provides the policy context for the mitigation actions related to the energy sector in table 17. Information on the sector (all energy), development focus (renewable energy or energy efficiency), related policy measures and specific interventions are provided in this table. The energy policy includes a renewable energy policy, which aims to achieve a 10 per cent share of the 5,000 MW capacity by 2020, and an energy efficiency policy, which aims at improvement of the energy efficiency by 20 per cent by 2020. The TTE noted that detailed information on energy policy level actions is not reported, but is reported at the project/programme level in the other tables.

42. Summary information on 12 mitigation actions is reported in tables 18 and 19, describing the objectives of the actions, coverage, progress indicators, steps taken and envisaged, estimated emission reductions and co-benefits. The two energy policy instruments reported in table 17 are implemented through various projects and instruments, including "financial support for grid-scale and off-grid renewable systems", the "households solar lantern distribution programme", the "solar PV electrification programme", "promoting appliance energy and transformation of refrigeration appliance market", the "households CFL light exchange programme" and "installation of capacitors in commercial/industry". In addition, in the energy sector, Ghana is implementing two projects for fuel diversification in thermal electricity generation through a national energy policy and Volta River Authority's power generation strategic plan, and diversification of urban transport through a national transport policy, an EPA act and motor emission standards, all of which contribute to emission reduction. For the AFOLU sector, four mitigation actions are reported in table 19.

43. The TTE noted that national programmes, such as the "national LPG programme", aiming to achieve 50 per cent of liquefied petroleum gas (LPG) penetration, the "improved cook stoves programme" and the "national biogas programme", are listed in table 17. Ghana has chosen not to report on them in detail as part of table 18; however, additional information on these measures is given in the third national communication, including mitigation actions in the waste sector based on the overall emissions contribution and availability of data and tools for the non-energy sector mitigation actions. The TTE noted that the transparency of the information reported could be enhanced if Ghana could provide a brief description of the overarching context for the mitigation actions reported in the BUR.

44. Annex 3 of the BUR provides additional information on a subset of mitigation actions described in tables 18 and 19. The tables in annex 3 provide general information, implementation information, targets, project objectives, project assessment boundaries, definitions of GHG assessment boundaries, baseline emissions, methodologies, GHG effects, monitoring of performance over time, uncertainties, assumptions, non-GHG effects, funding, etc. The TTE commends Ghana for reporting such a detailed description of the mitigation actions.

45. The TTE notes there are two mitigation actions that are included in table 18 but which are not described in more detail in annex 3: "financial support for climate mitigation technology uptake" and "financial support for grid-scale and off-grid renewable systems". For the action "energy efficiency measures in residential, commercial and industry sectors", the detailed information in annex 3 covers only implemented and ongoing projects and programmes under that action, and not a description of the action itself. The TTE notes that

the transparency of reporting could be further enhanced by providing detailed technical information on all mitigation actions.

46. Consistent with decision 2/CP.17, annex III, paragraph 12(a), Ghana provides the names of mitigation actions, coverage (sector and gases) and progress indicators in tables 18 and 19. Information on the description of mitigation actions, as well as on quantitative goals, is not provided in the BUR. The TTE noted that transparency of information reported could be enhanced if this information is included in the BUR. In response to clarification sought by the TTE, Ghana indicated its plans to submit detailed information on this action in its second BUR.

47. The nature of an action can be inferred from the "type instrument" column in tables 18 and 19, although the TTE noted that information in this column is not always consistent with the additional information provided in annex 3. In response to clarification sought by the TTE, Ghana indicated that, except for the "financial support for climate mitigation technology uptake" and "financial support for grid-scale and off-grid renewable systems" mitigation actions, where the "type of instrument" has been appropriately labelled as "economic", all the others should rather be considered as "project-based actions".

48. The TTE noted that the mitigation action "energy efficiency measures in residential, commercial and industry sectors" has a primary objective of increasing energy efficiency by 20 per cent, by 2030, but that detailed information given on it is project based. In response to clarification sought by the TTE, Ghana clarified that the 20 per cent energy efficiency target by 2030 is a national policy target that has been defined in the "national energy strategy" and "sustainable energy for all action plan". Thus, it is a policy measure that cuts across multiple sectors such as the commercial, household and industry sectors. The TTE noted that the energy efficiency improvement policy shown in table 17 demonstrates a policy goal of 20 per cent by 2020. The TTE notes that the transparency of reporting could be further enhanced if the relationship between the policy level mitigation actions and project level actions could be highlighted.

49. Consistent with decision 2/CP.17, annex III, paragraph 12(b), Ghana provides information on methodologies and assumptions for estimating the impact of mitigation actions in annex 3 of the BUR, except for the two actions indicated in paragraph 45 above. For "financial support for grid-scale and off-grid renewable systems", Ghana indicated that emission reductions have not been estimated. For "financial support for climate mitigation technology uptake", Ghana provided clarification to the TTE that the emission saving estimates indicated in the "estimated emissions reductions" column in table 18 were provided in the Business Plan of the Ghana Climate Technology Centre at the time of reporting, but no methodology description was given. During the technical analysis, Ghana clarified plans to report such specific detailed information for this action in its second BUR.

50. For the mitigation action "energy efficiency measures in residential, commercial and industry sectors", Ghana describes the methodologies and assumptions for three projects, and not the total effect of achieving the primary objective of this action, which is increasing the energy efficiency by 20 per cent by 2030. After clarification sought by the TTE, Ghana indicated that access to high-quality data was the major challenge that it experienced in the determination of emission savings.

51. The TTE noted that different electricity grid emission factors are assumed for different mitigation actions under the description of methodologies and assumptions. After technical clarification sought by the TTE, Ghana indicated that the use of different emission factors resulted from the various project owners/implementers who adopted different methodologies for the calculation of the grid emission factors. Ghana further indicated that in its next BUR, it will adopt a consistent factor that has been calculated by the energy sector regulator (Energy Commission) for the estimation of emission reductions for all grid-

scale mitigation actions. The TTE commends Ghana for making efforts to improve the consistency of the assumptions for mitigation actions.

52. Consistent with decision 2/CP.17, annex III, paragraph 12(c), Ghana, in its BUR, reports the objectives of the mitigation actions and steps taken or envisaged to achieve those actions. The TTE noted that the transparency of this information could be further enhanced by making clearer the distinctions between steps that have already been taken and steps that are envisaged for the future in order to achieve the primary objectives of all ongoing actions.

53. Consistent with decision 2/CP.17, annex III, paragraph 12(d), Ghana, in its BUR tables 18 and 19, reports the results achieved in the form of estimated emission reductions and co-benefits of actions. Progress of implementation, as well as the year for which the estimated emission reductions in tables 18 and 19 are reported, can be inferred from annex 3 of the BUR. Depending on the action, the results represent emission reduction estimates for different years. In some cases, the estimated emission reductions represent the cumulative values covering several years of implementation (e.g. "installation of capacitors in commercial/industry buildings"). The TTE considers that the transparency of the summary results reported in tables 18 and 19 could be further enhanced if the years for which achieved results, both past and future, are reported, are standardized.

54. Based on the information provided in annex 3, the TTE noted that for some of the mitigation actions, the monitored values of listed progress indicators are not available and thus the reduction estimates for past years are based on assumptions, rather than on monitoring the outcomes of progress indicators. For example, in "grid-connected solar installations", the electricity generation from solar capacity in 2014 is based on an assumption of 30 per cent of the availability, rather than the actual electricity generated by solar plants. Similarly, the emission reductions for the "households solar lantern distribution programme" are based on expert assumptions on how solar lanterns are used in households, rather than on actual kerosene sales. The emission reductions from the "Accra bus rapid transit system" action are based on expert judgement and assumptions of numbers of vehicles, fuel consumption, distance travelled, etc. The TTE noted that the transparency of the results reported could be further enhanced if the achieved results of actions are reported based on the monitoring of progress indicators of those actions, where possible.

55. The TTE noted some inconsistencies in the values for results achieved provided in tables 18 and 19 and in annex 3 of the BUR. After technical clarification sought by the TTE, Ghana indicated that any variation in the reported estimated emission reductions in tables 18 and 19 and annex 3 might have been caused by errors of transposition. The TTE noted that the transparency of reporting in the BUR could be enhanced by planning, developing and performing QA/QC procedures.

56. Ghana lists clean development mechanism (CDM) projects, two of which are in the energy sector and two are in the waste sector. Two projects have been registered and two are at the validation stage. Ghana also lists nine CDM programmes of activities in which it participates, eight of which are registered, and one is at the validation stage. In addition, information on the "form Ghana's reforestation of degraded forest reserves programme" is reported, which is the forest voluntary market project to earn verified carbon standard validation. Ghana reports that it aims to reforest 15,000 ha of degraded lands in the Asubima Forest Reserve, which will absorb more than 80,000 t CO_2 annually, and which has been independently validated by SCS Global Services under the verified carbon standard.

57. Ghana reports in its BUR that it has initiated a process to develop the design and operation of the domestic MRV system from 2015 to 2020 (see section 5 of the BUR).

4. Constraints and gaps, and related financial, technical and capacity-building needs, including a description of support needed and received

58. The TTE notes that Ghana has not submitted information on constraints and gaps. During the technical analysis, Ghana informed the TTE that such information is contained in the third national communication and hence it is not included in the BUR. The TTE considers that while the third national communication is not subjected to technical analysis, it contains specific information and that the transparency of reporting on the constraints and gaps could be enhanced by including this information explicitly in the BUR.

59. With regard to financial, technical and capacity-building needs, Ghana reported in its BUR that the financial support needed as a grant is USD 301,770,000 to implement the 12 priority activities listed in table 32 of the BUR.

60. Eight of the activities are classified as high priority and the other four as medium priority. Ghana also mentions that six of the activities require both financial and technical support. During the technical analysis, Ghana informed the TTE that the support needed will also cover the planned improvement areas for the AFOLU sector.

61. The TTE noted that Ghana did not explicitly include information on technology needs, which must be nationally determined. During the technical analysis, Ghana informed the TTE that the technology needs assessment is included in section 6.1.1 of the third national communication. Furthermore, Ghana informed the TTE that although a certain of level of training in some specific areas was received during the preparation of its BUR, additional training is needed. The TTE noted that the transparency could be enhanced by also reporting this information in the BUR.

62. Financial support for the preparation of the BUR was received from the Global Environment Facility (GEF) with the United Nations Environment Programme (UNEP) as the implementing agency. In 2013, the GEF/UNEP approved USD 352,000 for Ghana to start the preparation of its BUR after the project proposal and implementation plan were submitted and approved. Although the support that Ghana received was timely and effectively enabled the country to meet its reporting obligation, it did not cover the full cost of preparing the BUR; other partners also contributed through technical assistance.

63. With regard to financial resources, technology transfer, capacity-building and technical support received, the TTE notes that the USD 352,000 Ghana received to start the preparation of its BUR did not cover the full cost of preparation. In this context, Ghana developed 16 capacity-building activities (mainly in the form of training) on the seven macrothemes as listed in table 33 of the BUR.

64. Ghana presented detailed information on financial resources mobilized during the period 2011–2014 classified as domestic and external contributions through the four dominant channels (multilateral, bilateral, the GEF and national). The financial inflow for the period was USD 1,208,746,027, representing 3.7 per cent of the gross domestic product.

65. The TTE noted that Ghana reported summary information on 11 non-monetized activities relating to capacity-building and technology support received for the period 2011–2014. During the technical analysis, Ghana informed the TTE that, apart from the information on the support received for capacity-building reported in its BUR, sections 6.1.2.2 and 6.1.4.1 of the third national communication include additional information on support received for capacity-building for technology and technology transfer. The TTE noted that the transparency of reporting could be enhanced by also reporting this information in the BUR.

5. Domestic measurement, reporting and verification

66. Ghana reports, in its BUR, a description of domestic MRV arrangements. It has initiated the process of developing a four-stage programme to develop the design and operation of a domestic MRV system for the period 2015–2020. Ghana has taken an efficient and cost-effective method of mobilizing institutions and setting up processes for performing MRV functions on a sustainable basis at project, sector and national levels, by integrating the system into the existing national development M&E superstructure. The M&E system aims to monitor, among others, GHG emissions or reductions, climate-related support provided, sustainable development benefits and other effects of mitigation actions. The specific roles and responsibilities of different stakeholders will be determined through consultations. By integrating the MRV system into the national M&E framework, the relevant indicators of the MRV system will be developed and integrated into the national M&E system to monitor the implementation of mitigation and its effects for mitigation actions such as policies, programmes, measures or projects. The TTE commends the approach of Ghana for building on existing domestic systems and capacities and for taking a cost-effective approach.

67. Ghana reports that the M&E framework will track the implementation of national and sector policies and programmes and report it in an annual progress report (APR). The national APR will then be the main M&E framework for monitoring the implementation of mitigation actions and their GHG emission impacts and co-benefits. This report will be submitted to industry, and regulatory bodies such as EPA and the Energy Commission will be used to monitor facility level reporting. MRV/M&E templates will be developed and incorporated into the existing reporting template. The TTE welcomes this development and commends Ghana, especially for using consistent methods for reporting emission reductions.

D. Identification of capacity-building needs

68. In consultation with Ghana, the TTE identified the following capacity-building needs related to the facilitation of the preparation of subsequent BURs and participation in ICA:

(a) Use of the 2006 IPCC Guidelines and agriculture and land use (ALU) software for AFOLU GHG accounting, especially training on the use of the 2006 IPCC Guidelines and software, data processing and management strategies and training on the use of ALU and IPCC software;

(b) Improvement and strengthening of the GHG national system, particularly capacity-building on GHG data management and institutional arrangements;

(c) Improvement of the GHG inventory report;

(d) Development of a marginal abatement cost curve;

(e) Improvement in mitigation baseline setting;

(f) Continuous training of GHG experts, especially new experts on GHGs at the international level;

(g) Development of mitigation scenarios for the non-energy sector, especially marginal abatement curves;

(h) Improvement of forestry-wide mitigation and ensure linkages with the REDD-plus[1] forest reference level, including setting a common baseline with the REDD-plus forest reference level;

(i) Capacity-building for technology transfer and diffusion, including: improving the capacities of farmers, engineers, technicians and artisans; creating awareness and knowledge exchange; and facilitating sharing of lessons learned from pilot technology adoption initiatives;

(j) Improvements in the institutional arrangements;

(k) Uncertainty assessment for activity data and emission factors;

(l) Improvements of completeness checks and methods for estimation of emissions from product use as a substitute to ozone-depleting substances;

(m) Assessment and monitoring of the effects of GHGs on the policy level mitigation actions.

III. Conclusions

69. The TTE concludes that all of the elements of information listed in paragraph 3(a) of the ICA guidelines are included in the first BUR of Ghana.

70. The TTE commends Ghana for its comprehensive BUR and highlights the following from its analysis:

(a) Ghana has transparently reported on its national circumstances and institutional arrangements relevant for the preparation of its first BUR. A summary of information on its national circumstances is reported, in particular, the economic structure and key natural resource endowments that are relevant to mitigation. A comprehensive institutional arrangement for planning and implementation of climate change in the country is also reported. Ghana has integrated the institutional arrangements for national communications and BURs in order to carry out the preparation of national communications and BURs on a continuous basis. The TTE commends Ghana for its plan and road map to develop and operationalize a domestic MRV system, as outlined in the first BUR, which will contribute to achieving sustainable reporting;

(b) Ghana submitted, in its BUR, updates of its national GHG inventory covering emissions and removals of CO_2, CH_4, N_2O and PFCs for the years 1990–2012, using the 2006 IPCC Guidelines. Ghana did not use the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* and used the IPCC good practice guidance for uncertainty analysis, but this did not have a significant impact on the information provided in accordance with decisions 2/CP.17 and 17/CP.8. There are a few areas that, if addressed, could further enhance the transparency of the reported information, for example, by including the use of notation keys where no numerical values are provided, by providing a description of country- or plant-specific factors and by consistent use of mass units for reported gases. The BUR provided information on the missing sources in the current inventory, as well as source-specific planned improvements for each category. In parallel with the BUR, Ghana submitted a separate NIR that provided transparent and comprehensive explanations on the methods and data used to prepare the national GHG inventory. The TTE commends Ghana for including in the BUR information on the missing

[1] In decision 1/CP.16, paragraph 70, the Conference of the Parties encouraged developing country Parties to contribute to mitigation actions in the forest sector by undertaking the following activities: reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks.

sources in the current GHG inventory, as well as source-specific planned improvements for each category. The TTE noted that regular surveys to determine the completeness of all source categories could contribute further to enhancing the transparency of information on GHG emissions;

(c) Ghana has generally reported its mitigation actions transparently. Ghana has reported three tables for mitigation actions, one for the energy policy level mitigation actions (table 17), one for the mitigation actions for the energy sector (table 18) and one for the AFOLU sector (table 19), and annex 3, which describes most of the mitigation actions listed in tables 18 and 19. In total, 12 mitigation actions are reported, which cover CO_2, CH_4 and N_2O emission reductions. Ghana also reports in its BUR that it is in the process of developing a domestic MRV system for the period 2015–2020. This adopts an efficient and cost-effective way of mobilizing institutions and setting up the processes for performing MRV functions on a sustainable basis by integrating the system into the existing national M&E superstructure;

(d) Ghana has not included information on constraints and gaps and on technology needs in the BUR, but it is included in its third national communication. The transparency could be enhanced if the information is explicitly included in the BUR. Ghana has identified financial support needs for the implementation of 12 priority activities that are focused mainly on mitigation. Ghana presents detailed information on financial resources mobilized during the period 2011–2014 classified as domestic and external contributions through the four dominant channels (multilateral, bilateral, the GEF and national). For the preparation of its BUR, Ghana received USD 352,000 from the GEF in 2013, but this amount did not cover the full cost of preparing the BUR. Ghana has generally reported the constraints and gaps and support needed transparently. The TTE noted that the transparency of reporting could be further enhanced by also reporting this information in the BUR.

71. The TTE, in consultation with Ghana, identified 13 capacity-building needs related to the facilitation of reporting in accordance with annex III to decision 2/CP.17 and to the participation in ICA in accordance with annex IV to decision 2/CP.17, taking into account Article 4, paragraph 3, of the Convention, in chapter II.D above. The key capacity-building needs prioritized by Ghana are :

(a) Development of marginal abatement cost curve;

(b) Improvement in mitigation baseline setting;

(c) Development of mitigation scenario for non-energy sector, especially on marginal abatement curves;

(d) Improvement forestry-wide mitigation and ensure linkages with REDD+ forest reference level, including setting common baseline with REDD+ forest reference level;

(e) Uncertainty assessment for activity data and emission factors;

(f) Assessment and monitoring of the GHG effects on the policy–level mitigation actions.

Annex

Documents and information used during the technical analysis

A. Reference documents

"Composition, modalities and procedures of the team of technical experts for undertaking the technical analysis of biennial update reports from Parties not included in Annex I to the Convention". Annex to decision 20/CP.19. Available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a02.pdf#page=12>.

"Modalities and guidelines for international consultation and analysis". Annex IV to decision 2/CP.17. Available at <http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf>.

"UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention". Annex III to decision 2/CP.17. Available at <http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf>.

"Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention". Annex to decision 17/CP.8. Available at <http://unfccc.int/resource/docs/cop8/07a02.pdf#page=2>.

First biennial update report of Ghana. Available at <http://unfccc.int/8722.php>.

Third national communication of Ghana. Available at <http://unfccc.int/national_reports/non-annex_i_natcom/items/2979.php>.

B. Additional information provided by the Party

The following document was provided by the Party in response to clarification sought during the technical analysis:

National greenhouse gas inventory report of Ghana. Available at <http://unfccc.int/resource/docs/natc/ghanir.pdf>.